

ABSTRACT OF THE DISCLOSURE

The invention provides a diverse population of uniquely labeled probes, containing about thirty or more target specific nucleic acid probes each attached to a unique label bound to a nucleic acid. Also provided is a method of producing a population of uniquely labeled nucleic acid probes. The method consists of (a) synthesizing a population of target specific nucleic acid probes each having a different specifier; (b) synthesizing a corresponding population of anti-genedigits each having a unique label, the population having a diversity sufficient to uniquely hybridize to genedigits within the specifiers, and (c) hybridizing the populations of target nucleic acid probes to the anti-genedigits, to produce a population in which each of the target specific probes is uniquely labeled. Also provided is a method of detecting a nucleic acid analyte. The method consists of (a) contacting a mixture of nucleic acid analytes under conditions sufficient for hybridization with a plurality of target specific nucleic acid probes each having a different specifier; (b) contacting the mixture under conditions sufficient for hybridization with a corresponding plurality of anti-genedigits each having a unique label, the plurality of anti-genedigits having a diversity sufficient to uniquely hybridize to genedigits within the specifiers, and (c) uniquely detecting a hybridized complex between one or more analytes in the mixture, a target specific probe, and an anti-genedigit.

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